

THE *School of Mines Quarterly* is the title of a journal published under the auspices of the Chemical and Engineering Society of the School of Mines, Columbia College, New York, the first number of which has been sent us. It contains several good articles on chemical and engineering subjects. There seems no keeping pace with the scientific enterprise of our friends on the other side of the water.

FRIEDLANDER AND SON, of Berlin, have sent us their new Catalogue of Standard Publications in Astronomy and Geodesy, brought up to the present time

A FOURTH edition has been published of Mr. Thomas Christy's useful brochure on "Hydro-Incubation in Theory and Practice, a Guide to Commercial Poultry Farming." We have referred to the previous editions; the whole of the matter in this edition is stated to be new.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus erythraeus*) from India, presented by Mr. F. G. Lightfoot; a Bonnet Monkey (*Macacus radiatus*) from India, presented by the Rev. E. C. Ince; a Ring-tailed Lemur (*Lemur catta*) from Madagascar, presented by Mr. F. E. Colenso; a Black-headed Jay (*Cyanocorax nigriceps*) from South America, two Brant Geese (*Bernicla brenta*), European, purchased.

OUR ASTRONOMICAL COLUMN

THE COMET OF 1652.—The observations of this comet made by Hevelius between December 20, 1652, and January 8, 1653, it is remarked by Pingre, were probably the most precise, and certainly the most complete, of all; generally the observations were very rough. They were mostly collected, he adds, in a short dissertation published at Padua in 1653, which would appear to be that by Argoli, entitled "Andreae Argoli Brevis Dissertatio de cometâ ann. 1652, 1653 et aliqua de meteorologicis impressionibus." Halley's orbit, the only one for this comet which figures in our catalogues, was calculated upon the observations of Hevelius.

Zach found another series of observations, which Pingre probably had not seen, and which upon reduction and discussion may prove to be second only to those of the Dantzic astronomer in merit; indeed, he thought they might be even more precise. These observations were made by an ecclesiastic residing at Rome, an Englishman, one calling himself, or being called by others, *Riccardo de Albis*, a name which, Zach suggests, is probably to be read *Richard White*, and he conjectures that he was probably a Jesuit of the Anglican College, where we know that another English Jesuit, LeMaire, Boscovich's assistant in geodetic work, also observed. The observations were sent from Rome in January, 1653, by a certain Raffaello Magiotti to his good friend Candido del Buono at Florence, with a commission to present them to Prince Leopold of Tuscany, brother of the reigning Grand Duke Ferdinand II. Magiotti mentions that he had procured the observations with difficulty since De Albis himself intended to print them, *con molte puntualità*. Whether he did so or not does not appear; his name is not mentioned in the cometographies, and though Lalande enumerates some twenty publications referring to the comet of 1652, there is none under the name of De Albis. We are told that he observed with a good quadrant, but there is no reference to telescopic sights, though Zach says, with two such opticians as Campani and Divini at this time in Rome, it may well have been that he had telescopic aid.

The observations in question appear in Angelo Fabroni's little known "Lettere inedite di Uomini illustre," as a supplement to his greater work published at Pisa in 1768. They were made between December 21 and January 3, "hora 2 post occasum solis," and consist of distances from conspicuous stars. It may be of interest to reduce the observations of this scientific Englishman, and to calculate an orbit upon them; a strict copy was given by Zach in Lindenau and Bohnenberger's *Zeitschrift für Astronomie*, vol. iv.

In the same communication will be found some observations by a Roman patrician, one Arcieri, with "a good telescope of 9 palms, by Eustachio Divini." He saw the comet for the first time on December 19, "instar nubeculæ rotundatæ et candi-

cantis, e cujus centro quiddam subricundum instar prunæ emicabat, ejusque diameter visiva erat 10 circiter minutorum." On December 21, its diameter was fifteen minutes. It seems to have been well seen on the following night, when we read "Porro cauda illius (quæ rarissima quidem erat, tenuissimaque) in oriente vergens, æquabat longitudine spatium pene 8 graduum, et dimetiens visiva excreverat jam ad 20 fere minuta." On December 23 it appeared much more obscure, but on December 24 at the fourth hour of the night the tail was brightest, the head being one degree from the Pleiades. Five nights later it was distant "circiter 30 minutis a capite Medusæ versus Plejadas, multum imminutus obscuratusque, nullumque caudæ vestigium apparebat." On January 1 it was as bright as a star of the fourth magnitude, and two nights later was hardly equal to one of the fifth.

Pingre remarks that in the judgment of Hevelius and Comiers this comet almost equalled the moon in size. It was nearest to the earth on December 19, when its distance was 0.13 of the earth's mean distance from the sun, so that it approached our globe as close as its orbit admits.

METEORS ON OCTOBER 19.—M. E. Block, of Odessa, records a notable shower of meteors on the morning of October 19, between 3h. and 5h.; he says he had not previously seen so many meteors. In an interval of ten minutes he counted fourteen which passed through the field of his comet-seeker, two degrees in diameter; the radiant was at β Aurigæ, or in about R.A. 88°, Decl. 45°. This radiant agrees nearly with No. 92 in Major Tupman's list.

GEOLOGICAL NOTES

UPPER DEVONIAN ROCKS OF THE NORTH OF FRANCE.—In a recent communication to the Geological Society of the North of France, Prof. Gosselet has brought forward some important new data, obtained from some fresh railway-cuttings between Féron and Semeries, as to the classification and palæontology of the Upper Devonian rocks. Arranging the Upper Devonian into an inferior group—the *Frasnien* comprising the zone of *Rhynchonella cuboides* and that of *Cardium palmatum*, and a superior group—the *Famennien*, in which are placed the Schistes de Famenne, the Psammites de Condros, and the Calcaire d'Étroeu-ungt, he proceeds to show that in sections exposed in the railway-cuttings with a perfect conformable succession of strata and of fossils, the zone of the Psammites de Condros, so well marked elsewhere in the north of France and Belgium, is absent. He regards this arenaceous series to be represented in the district between Avesnes and Fourmies by argillaceous shales. It is easy to recognise at least an upper and lower member in the Famennian group. The former is distinguished by the prevalence of Carboniferous forms, particularly *Spirifer laminosus*, the latter by the rarity of Carboniferous forms and by the abundance of *Cyrtia Murchisoniana*. Every fresh section which tends to elucidate the relations of the Devonian rocks to the formations below and above them possesses a special interest for British geologists.

TERTIARY QUARTZITES OF THE ARDENNES.—Dr. Charles Barrois has laid before the same Society an interesting paper on the extension of the Lower Tertiary beds of the Paris basin across to the Palæozoic plateau of the Ardennes. He shows that the lower members, consisting of sandstones and conglomerates, can be traced by their fragments for a long distance to the north-east, and that these fragments, like our own Grey Wethers or Sarsen stones, are portions of deposits which have been gradually broken up and weathered in place. The existence of these boulders has long been recognised and they have been variously explained, being sometimes considered as drifted blocks. Dr. Barrois, however, demonstrates their true origin by tracing them step by step to their source in the Gres Landeniens. He makes some suggestive remarks regarding the superficial alteration of some of these rocks. In the centre they are undoubted sandstones, but towards the exterior they become progressively harder till they pass into true quartzite. He even obtained specimens of sandstone covered with a mere coating of quartzite two centimetres in thickness. He observed that in proportion as they are traced eastward, that is, into tracts where they must have been longer exposed to atmospheric influences, the alteration penetrates further into them. A microscopic examination failed to afford him any clue to the process of alteration. The quartzite when examined in thin sections

appears as a true quartz-sand, the grains of which are so minute that no interstice can be seen between them. It is an excessively compact rock, in which a matrix is hardly appreciable.

PYRENEES MARBLE.—In another paper Dr. Barrois gives information regarding the *Marbre Griotte*, now so largely worked for ornamental purposes in the Spanish and French Pyrenees. This rock, usually regarded as Devonian, and placed on a parallel with the red limestone of Westphalia and Nassau, is shown by him to rest unconformably on Devonian strata in the Western Pyrenees, to be covered by a *Productus* limestone of true Carboniferous date, and to contain in itself a fauna which, by its crustacea (*Phillipsia*), and more especially by its *Goniatites*, must be regarded as Carboniferous. He therefore concludes that the Griotte limestone or marble constitutes the basement member of the Carboniferous system of the region in which it occurs.

PETROGRAPHY IN SPAIN.—The progress of petrography is well illustrated by the appearance of an essay on the evolution of volcanic rocks in general and of those of the Canaries in particular, by Don Salvador Calderon, of Arana, just published in the *Annals of the Spanish Society of Natural History*. He reduces all the rocks of the Canary Islands into two grand categories—a sanidine-amphibole group and a plagioclase-augite group. Thus, out of a paste of augite and plagioclase he conceives that all the rocks of the second category may have been formed, with the addition of other accidental minerals, and by a variation in the proportions. So that at the end of the one series he places a nepheline-basalt containing sanidine, and he traces a gradation from this rock through the disappearance of the sanidine, the successive appearance of haüyne and olivine, and the final predominance of the latter mineral, till he reaches the felspathic basalts, dolerites, and modern lavas. He discusses the evolution of volcanic rocks under four periods:—1. The Lava period, in which section he treats of the vitreous fluidity of lava, the influence of temperature, pressure, and water in the formation of the rock, and the possibility of an arrangement or liquation of the component elements of the lava while still melted within the volcano. 2. The Refrigeration period. Here he discusses the crystallisation of the lava, noting particularly the results of the evaporation of the interstitial water, the formation of the "micro-fluctuation" structure, the development of porphyritic crystals, and the effects of sublimation. 3. Changes in the rocks after solidification; divided into (1) mechanical, which include fractures on the great scale, cracks in the paste of the rocks, fissuring of the crystals, and the formation of cavities and globules; (2) physical, embracing the phenomena of devitrification; and (3) chemical, under which are placed serpentinisation, zeolitisation, natrolitisation, &c. 4. The Decomposition period. Under this heading the author, citing the researches of Durocher, Bischof, and Delesse on the permeability of rocks by meteoric water, and the changes thereby produced, gives a brief account of the nature of the alterations of some of the more prevalent minerals in the rocks of the Canary Islands and elsewhere. The paper is illustrated by a few drawings of microscopic structures.

GEOGRAPHICAL NOTES

FURTHER details are to hand concerning the sojourn of the Russian, Lieut. Tjagin, and a colony of Samoyedes in Novaya Zemlya during last winter and summer. The object of Tjagin's stay on the island was to complete the arrangements for a station for the help of shipwrecked sailors, and to carry out a series of meteorological observations for a whole year. Tjagin arrived at the harbour of Karmakul on August 15, 1878. By September 13 the necessary buildings of wood were completed, and the meteorological instruments installed, and by October 3 all the Samoyedes were collected about the station. The autumn of 1878 was dull, rainy, and cold. The mean temperature was about 4° Centigrade. The first frost was on September 26. The first snow fell on the 28th, and the sea froze on October 10. Ice-crust and drift-ice were seen on the sea in the middle of October, and the harbour of Karmakul, as well as all the small bays, were covered with ice on November 13. But Moller Bay did not freeze during the whole winter, except among the islands which lie thick along the coast. The melting of the snow began with the first thaw, about the middle of May, and the first green was seen on the cleared spots near to the snow-heaps. On June 14 the islands were covered with verdure and flowers, but the harbour of Karmakul and the little bays were not free from

ice till July 16, and the small lakes July 22. The mean temperatures were in November, -9°·8 C.; February, -17°·8; March, -11°·8. During the five winter months the mean was -12°·2. In January the temperature sank to -32°·1, and rose in November to +0°·8, and in January to +0°·2. The movement of the atmosphere varied from complete calm, rare mild winds from south-west and north-west, strong winds from east-south-east, rising to raging storms, which greatly impeded hunting operations. The quantity of snow which fell was considerable; it snowed seldom, but the strong land winds drove the snow from the distant hills and the neighbouring heaps towards the west, and often covered the houses up to the roof on one side, while on the three other sides the snow was blown clean off the ground. Tjagin returned to Archangel on August 17 with two orphans belonging to one of the Samoyedes who died during the winter. He maintains that wintering in Novaya Zemlya is quite practicable, especially for Samoyedes. The practicability of erecting a refuge station with provisions has also been proved. But a store of provisions is absolutely necessary, as it seems impossible to obtain by hunting anything like a sufficient quantity of animal food during the winter.

DETAILS have reached this country of the expedition led by Mr. Alexander Forrest into the unknown north-eastern part of Western Australia. Forrest left the Beagle Bay, south of King's Sound, on April 20 last, with seven companions and twenty-six horses, proceeded to the mouth of the Fitzroy River in 17° 41' lat. S., and 123° 36' long. E., investigated this unknown river as far as its sources in a mountain ridge 2,000 feet high, in 17° 42' lat. S., and 126° 10' long. E., then followed a tributary to its source in a mountain chain (in 18° lat. S., and 127° 40' long. E.), crossed these mountains and discovered a large river in 128° 10' long. E., which he followed for nine miles. The eastern boundary of the colony was reached in 16° 50' lat. S., and 129° long. E. Here almost all provisions failed the travellers, yet they proceeded on North Australian ground to the Victoria River, and reached Catherine Station of the overland telegraph (forty-four miles south of Port Darwin) on September 18, in a very exhausted condition. Fifteen out of the twenty-six horses had perished, and three more had been killed and eaten. Mr. Forrest reports that he discovered 20,000,000 acres of excellent pasture land, of which a large proportion would be well adapted for growing sugar cane, rice, coffee, &c. Water was everywhere in abundance, except on the last twenty-two miles of the march. The numerous natives the party encountered all behaved in a most friendly manner.

A TELEGRAM from Col. Prshevski has been received via Peking. It appears that the traveller and his party reached Shatshkoo at the end of June, after marching through the Shami desert, which in its centre rises to an elevation of 5,000 feet. The oasis of Shatshkoo, situated at an altitude of 3,500 feet, is very fertile. On the south it is bounded by a mountain side which begins at Lake Lob-Nor, and is covered with eternal snow in many places. The travellers intended remaining on the mountains until the end of July, and then to proceed to Hlassa.

WE have received from the U.S. Survey copies of several new maps of recently surveyed regions, beautifully finished. They are the Yellowstone National Park, on a scale of two miles to one inch; parts of Western Wyoming, South-eastern Idaho, and North-eastern Utah, and part of Central Wyoming, on the scale of four miles to one inch; a drainage map of portions of Wyoming, Idaho, and Utah, on the scale of eight miles to an inch.

HEFT I. for 1878-9 of the *Mittheilungen* of the Hamburg Geographical Society, is entirely devoted to Africa. Dr. G. A. Fischer, of Zanzibar, contributes a valuable original paper on the Wapokomo Land and its inhabitants; Herr A. Woermann, a Hamburg merchant, discusses the products of West Africa from a commercial point of view; Dr. Hubbe-Schleiden, in a learned and elaborate paper, discusses the Negro's capacity for culture.

In the December number of *Petermann's Mittheilungen*, Dr. Junker describes in considerable detail the results of his journeys in 1877-8 to the west of the White Nile, from Lado to about 29° E. long., and south to 3° 15' N. lat., results of great importance for a knowledge of a scarcely known region.

NEWS from Zanzibar announces the safe arrival of the united Belgian expedition at Ugogo.